SEQUENCE LISTING

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ROSEN, VICKI A.

<120> NOVEL BMP PRODUCTS

<130> 08702.0039-02000

<140> 09/804,625
<141> 2001-03-09

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<151> 1997-09-09

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<170> PatentIn Ver. 3.3

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Gly His Asp Gly Lys Gly His Pro Leu His Arg Arg Glu Lys Arg Gln
1 5 10 15

gca aaa cac aaa cag cgg aaa cgc ctc aag tcc agc tgt aag aga cac 96
Ala Lys His Lys Gln Arg Lys Arg Leu Lys Ser Ser Cys Lys Arg His
20 25 30

cct tta tat gtg gac ttc agt gat gtg ggg tgg aat gac tgg atc gtt 144
Pro Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp Ile Val
35 40 45

gca ccg ccg ggg tat cat gcc ttt tac tgc cat ggg gag tgc cct ttt 192
Ala Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe
50 55 60

ccc ctg gcc gat cac ctt aac tcc acg aat cat gcc att ctc caa act 240
Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Ile Leu Gln Thr
65 70 75 80

ctg gtc aac tca gtt aac tct aag att ccc aag gca tgc tgt gtc cca 288
Leu Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro
85 90 95

aca gag ctc agc gcc atc tcc atg ctg tac ctt gat gag aat gag aag 336
Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
100 105 110

gtg gta tta aag aac tat cag gac atg ggt gtc gag ggt tgt ggg tgt 384
Val Val Leu Lys Asn Tyr Gln Asp Met Gly Val Glu Gly Cys Gly Cys
115 120 125

cgt tagcacagca aaataaaata taaatatata tatatatata ttagaaaaac 437
Arg

agcaaaaaaa tcaagttgac actttaatat ttcccaatga agactttatt tatggaatgg 497

aatggagaaa aagaaaaaca cagctatttt gaaaactata tttatatcta ccgaaaagaa 557

gttgggaaaa caaatatttt aatcagagaa ttatt 592

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<213> Bos taurus

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Ala Lys His Lys Gln Arg Lys Arg Leu Lys Ser Ser Cys Lys Arg His
20 25 30

Pro Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp Ile Val
35 40 45

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Ala Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe
     50                  55                  60

Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Ile Leu Gln Thr
 65                  70                  75                  80

Leu Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro
                 85                  90                  95

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
            100                 105                 110

Val Val Leu Lys Asn Tyr Gln Asp Met Gly Val Glu Gly Cys Gly Cys
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ccgagcccca ccgcccctcc actcctcggc cttgcccgac actgagacgc tgttcccagc 180

gtgaaaagag agactgcgcg gccggcaccc gggagaagga ggaggcaaag aaaaggaacg 240

gacattcggt ccttgcgcca ggtcctttga ccagagtttt tccatgtgga cgctctttca 300

atggacgtgt ccccgcgtgc ttcttagacg gactgcggtc tcctaaaggt cgacc atg  358
                                                            Met
                                                              1

gtg gcc ggg acc cgc tgt ctt cta gcg ttg ctg ctt ccc cag gtc ctc   406
Val Ala Gly Thr Arg Cys Leu Leu Ala Leu Leu Leu Pro Gln Val Leu
               5                  10                  15

ctg ggc ggc gcg gct ggc ctc gtt ccg gag ctg ggc cgc agg aag ttc   454
Leu Gly Gly Ala Ala Gly Leu Val Pro Glu Leu Gly Arg Arg Lys Phe
          20                  25                  30

gcg gcg gcg tcg tcg ggc cgc ccc tca tcc cag ccc tct gac gag gtc   502
Ala Ala Ala Ser Ser Gly Arg Pro Ser Ser Gln Pro Ser Asp Glu Val
     35                  40                  45
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ctg agc gag ttc gag ttg cgg ctg ctc agc atg ttc ggc ctg aaa cag   550
Leu Ser Glu Phe Glu Leu Arg Leu Leu Ser Met Phe Gly Leu Lys Gln
 50                  55                  60                  65

aga ccc acc ccc agc agg gac gcc gtg gtg ccc ccc tac atg cta gac   598
Arg Pro Thr Pro Ser Arg Asp Ala Val Val Pro Pro Tyr Met Leu Asp
                 70                  75                  80

ctg tat cgc agg cac tca ggt cag ccg ggc tca ccc gcc cca gac cac   646
Leu Tyr Arg Arg His Ser Gly Gln Pro Gly Ser Pro Ala Pro Asp His
             85                  90                  95

cgg ttg gag agg gca gcc agc cga gcc aac act gtg cgc agc ttc cac   694
Arg Leu Glu Arg Ala Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His
        100                 105                 110

cat gaa gaa tct ttg gaa gaa cta cca gaa acg agt ggg aaa aca acc   742
His Glu Glu Ser Leu Glu Glu Leu Pro Glu Thr Ser Gly Lys Thr Thr
    115                 120                 125

cgg aga ttc ttc ttt aat tta agt tct atc ccc acg gag gag ttt atc   790
Arg Arg Phe Phe Phe Asn Leu Ser Ser Ile Pro Thr Glu Glu Phe Ile
130                 135                 140                 145

acc tca gca gag ctt cag gtt ttc cga gaa cag atg caa gat gct tta   838
Thr Ser Ala Glu Leu Gln Val Phe Arg Glu Gln Met Gln Asp Ala Leu
                150                 155                 160

gga aac aat agc agt ttc cat cac cga att aat att tat gaa atc ata   886
Gly Asn Asn Ser Ser Phe His His Arg Ile Asn Ile Tyr Glu Ile Ile
            165                 170                 175

aaa cct gca aca gcc aac tcg aaa ttc ccc gtg acc aga ctt ttg gac   934
Lys Pro Ala Thr Ala Asn Ser Lys Phe Pro Val Thr Arg Leu Leu Asp
        180                 185                 190

acc agg ttg gtg aat cag aat gca agc agg tgg gaa agt ttt gat gtc   982
Thr Arg Leu Val Asn Gln Asn Ala Ser Arg Trp Glu Ser Phe Asp Val
    195                 200                 205

acc ccc gct gtg atg cgg tgg act gca cag gga cac gcc aac cat gga   1030
Thr Pro Ala Val Met Arg Trp Thr Ala Gln Gly His Ala Asn His Gly
210                 215                 220                 225

ttc gtg gtg gaa gtg gcc cac ttg gag gag aaa caa ggt gtc tcc aag   1078
Phe Val Val Glu Val Ala His Leu Glu Glu Lys Gln Gly Val Ser Lys
                230                 235                 240

aga cat gtt agg ata agc agg tct ttg cac caa gat gaa cac agc tgg   1126
Arg His Val Arg Ile Ser Arg Ser Leu His Gln Asp Glu His Ser Trp
            245                 250                 255

tca cag ata agg cca ttg cta gta act ttt ggc cat gat gga aaa ggg   1174
Ser Gln Ile Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Lys Gly
        260                 265                 270
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cat cct ctc cac aaa aga gaa aaa cgt caa gcc aaa cac aaa cag cgg   1222
His Pro Leu His Lys Arg Glu Lys Arg Gln Ala Lys His Lys Gln Arg
    275                 280                 285

aaa cgc ctt aag tcc agc tgt aag aga cac cct ttg tac gtg gac ttc   1270
Lys Arg Leu Lys Ser Ser Cys Lys Arg His Pro Leu Tyr Val Asp Phe
290                 295                 300                 305

agt gac gtg ggg tgg aat gac tgg att gtg gct ccc ccg ggg tat cac   1318
Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr His
                310                 315                 320

gcc ttt tac tgc cac gga gaa tgc cct ttt cct ctg gct gat cat ctg   1366
Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His Leu
            325                 330                 335

aac tcc act aat cat gcc att gtt cag acg ttg gtc aac tct gtt aac   1414
Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn
        340                 345                 350

tct aag att cct aag gca tgc tgt gtc ccg aca gaa ctc agt gct atc   1462
Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile
    355                 360                 365

tcg atg ctg tac ctt gac gag aat gaa aag gtt gta tta aag aac tat   1510
Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn Tyr
370                 375                 380                 385

cag gac atg gtt gtg gag ggt tgt ggg tgt cgc tagtacagca aaattaaata 1563
Gln Asp Met Val Val Glu Gly Cys Gly Cys Arg
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cataaatata tatatatata tatattttag aaaaaagaaa aaaa                  1607
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<212> PRT
<213> Homo sapiens

<400> 4

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             20                  25                  30

Phe Ala Ala Ala Ser Ser Gly Arg Pro Ser Ser Gln Pro Ser Asp Glu
         35                  40                  45

Val Leu Ser Glu Phe Glu Leu Arg Leu Leu Ser Met Phe Gly Leu Lys
     50                  55                  60

Gln Arg Pro Thr Pro Ser Arg Asp Ala Val Val Pro Pro Tyr Met Leu
 65                  70                  75                  80
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Asp Leu Tyr Arg Arg His Ser Gly Gln Pro Gly Ser Pro Ala Pro Asp
                  85                  90                  95

His Arg Leu Glu Arg Ala Ala Ser Arg Ala Asn Thr Val Arg Ser Phe
             100                 105                 110

His His Glu Glu Ser Leu Glu Glu Leu Pro Glu Thr Ser Gly Lys Thr
         115                 120                 125

Thr Arg Arg Phe Phe Phe Asn Leu Ser Ser Ile Pro Thr Glu Glu Phe
     130                 135                 140

Ile Thr Ser Ala Glu Leu Gln Val Phe Arg Glu Gln Met Gln Asp Ala
145                 150                 155                 160

Leu Gly Asn Asn Ser Ser Phe His His Arg Ile Asn Ile Tyr Glu Ile
                165                 170                 175

Ile Lys Pro Ala Thr Ala Asn Ser Lys Phe Pro Val Thr Arg Leu Leu
            180                 185                 190

Asp Thr Arg Leu Val Asn Gln Asn Ala Ser Arg Trp Glu Ser Phe Asp
        195                 200                 205

Val Thr Pro Ala Val Met Arg Trp Thr Ala Gln Gly His Ala Asn His
    210                 215                 220

Gly Phe Val Val Glu Val Ala His Leu Glu Glu Lys Gln Gly Val Ser
225                 230                 235                 240

Lys Arg His Val Arg Ile Ser Arg Ser Leu His Gln Asp Glu His Ser
                245                 250                 255

Trp Ser Gln Ile Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Lys
            260                 265                 270

Gly His Pro Leu His Lys Arg Glu Lys Arg Gln Ala Lys His Lys Gln
        275                 280                 285

Arg Lys Arg Leu Lys Ser Ser Cys Lys Arg His Pro Leu Tyr Val Asp
    290                 295                 300

Phe Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr
305                 310                 315                 320

His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His
                325                 330                 335

Leu Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val
            340                 345                 350

Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala
        355                 360                 365

Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn
    370                 375                 380
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Tyr Gln Asp Met Val Val Glu Gly Cys Gly Cys Arg
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<222> (403)..(1626)

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agtatctagc ttgtctcccc gatgggattc ccgtccaagc tatctcgagc ctgcagcgcc 180

acagtccccg gccctcgccc aggttcactg caaccgttca gaggtcccca ggagctgctg 240

ctggcgagcc cgctactgca gggacctatg gagccattcc gtagtgccat cccgagcaac 300

gcactgctgc agcttccctg agcctttcca gcaagtttgt tcaagattgg ctgtcaagaa 360

tcatggactg ttattatatg ccttgttttc tgtcaagaca cc atg att cct ggt    414
                                              Met Ile Pro Gly
                                                1

aac cga atg ctg atg gtc gtt tta tta tgc caa gtc ctg cta gga ggc   462
Asn Arg Met Leu Met Val Val Leu Leu Cys Gln Val Leu Leu Gly Gly
  5                  10                  15                  20

gcg agc cat gct agt ttg ata cct gag acg ggg aag aaa aaa gtc gcc   510
Ala Ser His Ala Ser Leu Ile Pro Glu Thr Gly Lys Lys Lys Val Ala
                25                  30                  35

gag att cag ggc cac gcg gga gga cgc cgc tca ggg cag agc cat gag   558
Glu Ile Gln Gly His Ala Gly Gly Arg Arg Ser Gly Gln Ser His Glu
            40                  45                  50

ctc ctg cgg gac ttc gag gcg aca ctt ctg cag atg ttt ggg ctg cgc   606
Leu Leu Arg Asp Phe Glu Ala Thr Leu Leu Gln Met Phe Gly Leu Arg
        55                  60                  65

cgc cgc ccg cag cct agc aag agt gcc gtc att ccg gac tac atg cgg   654
Arg Arg Pro Gln Pro Ser Lys Ser Ala Val Ile Pro Asp Tyr Met Arg
    70                  75                  80

gat ctt tac cgg ctt cag tct ggg gag gag gag gaa gag cag atc cac   702
Asp Leu Tyr Arg Leu Gln Ser Gly Glu Glu Glu Glu Glu Gln Ile His
 85                  90                  95                  100
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agc act ggt ctt gag tat cct gag cgc ccg gcc agc cgg gcc aac acc   750
Ser Thr Gly Leu Glu Tyr Pro Glu Arg Pro Ala Ser Arg Ala Asn Thr
                105                 110                 115

gtg agg agc ttc cac cac gaa gaa cat ctg gag aac atc cca ggg acc   798
Val Arg Ser Phe His His Glu Glu His Leu Glu Asn Ile Pro Gly Thr
            120                 125                 130

agt gaa aac tct gct ttt cgt ttc ctc ttt aac ctc agc agc atc cct   846
Ser Glu Asn Ser Ala Phe Arg Phe Leu Phe Asn Leu Ser Ser Ile Pro
        135                 140                 145

gag aac gag gtg atc tcc tct gca gag ctt cgg ctc ttc cgg gag cag   894
Glu Asn Glu Val Ile Ser Ser Ala Glu Leu Arg Leu Phe Arg Glu Gln
    150                 155                 160

gtg gac cag ggc cct gat tgg gaa agg ggc ttc cac cgt ata aac att   942
Val Asp Gln Gly Pro Asp Trp Glu Arg Gly Phe His Arg Ile Asn Ile
165                 170                 175                 180

tat gag gtt atg aag ccc cca gca gaa gtg gtg cct ggg cac ctc atc   990
Tyr Glu Val Met Lys Pro Pro Ala Glu Val Val Pro Gly His Leu Ile
                185                 190                 195

aca cga cta ctg gac acg aga ctg gtc cac cac aat gtg aca cgg tgg   1038
Thr Arg Leu Leu Asp Thr Arg Leu Val His His Asn Val Thr Arg Trp
            200                 205                 210

gaa act ttt gat gtg agc cct gcg gtg ctt cgc tgg acc cgg gag aag   1086
Glu Thr Phe Asp Val Ser Pro Ala Val Leu Arg Trp Thr Arg Glu Lys
        215                 220                 225

cag cca aac tat ggg cta gcc att gag gtg act cac ctc cat cag act   1134
Gln Pro Asn Tyr Gly Leu Ala Ile Glu Val Thr His Leu His Gln Thr
    230                 235                 240

cgg acc cac cag ggc cag cat gtc agg att agc cga tcg tta cct caa   1182
Arg Thr His Gln Gly Gln His Val Arg Ile Ser Arg Ser Leu Pro Gln
245                 250                 255                 260

ggg agt ggg aat tgg gcc cag ctc cgg ccc ctc ctg gtc acc ttt ggc   1230
Gly Ser Gly Asn Trp Ala Gln Leu Arg Pro Leu Leu Val Thr Phe Gly
                265                 270                 275

cat gat ggc cgg ggc cat gcc ttg acc cga cgc cgg agg gcc aag cgt   1278
His Asp Gly Arg Gly His Ala Leu Thr Arg Arg Arg Arg Ala Lys Arg
            280                 285                 290

agc cct aag cat cac tca cag cgg gcc agg aag aag aat aag aac tgc   1326
Ser Pro Lys His His Ser Gln Arg Ala Arg Lys Lys Asn Lys Asn Cys
        295                 300                 305

cgg cgc cac tcg ctc tat gtg gac ttc agc gat gtg ggc tgg aat gac   1374
Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp
    310                 315                 320
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tgg att gtg gcc cca cca ggc tac cag gcc ttc tac tgc cat ggg gac   1422
Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly Asp
325                 330                 335                 340

tgc ccc ttt cca ctg gct gac cac ctc aac tca acc aac cat gcc att   1470
Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Ile
                345                 350                 355

gtg cag acc ctg gtc aat tct gtc aat tcc agt atc ccc aaa gcc tgt   1518
Val Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile Pro Lys Ala Cys
            360                 365                 370

tgt gtg ccc act gaa ctg agt gcc atc tcc atg ctg tac ctg gat gag   1566
Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu
        375                 380                 385

tat gat aag gtg gta ctg aaa aat tat cag gag atg gta gta gag gga   1614
Tyr Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly
    390                 395                 400

tgt ggg tgc cgc tgagatcagg cagtccttga ggatagacag atatacacac       1666
Cys Gly Cys Arg
405

cacacacaca caccacatac accacacaca cacgttccca tccactcacc cacacactac 1726

acagactgct tccttatagc tggactttta tttaaaaaaa aaaaaaaaaa aatggaaaaa 1786

atccctaaac attcaccttg accttattta tgactttacg tgcaaatgtt ttgaccatat 1846

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agtcattatt ttaaaaaaaa aaaaaaaact ctagagtcga cggaattc              1954
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<213> Homo sapiens

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             20                  25                  30

Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly Arg Arg Ser Gly
         35                  40                  45

Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr Leu Leu Gln Met
     50                  55                  60

Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser Ala Val Ile Pro
 65                  70                  75                  80
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Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly Glu Glu Glu Glu
                 85                  90                  95

Glu Gln Ile His Ser Thr Gly Leu Glu Tyr Pro Glu Arg Pro Ala Ser
            100                 105                 110

Arg Ala Asn Thr Val Arg Ser Phe His His Glu Glu His Leu Glu Asn
        115                 120                 125

Ile Pro Gly Thr Ser Glu Asn Ser Ala Phe Arg Phe Leu Phe Asn Leu
    130                 135                 140

Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser Ala Glu Leu Arg Leu
145                 150                 155                 160

Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp Glu Arg Gly Phe His
                165                 170                 175

Arg Ile Asn Ile Tyr Glu Val Met Lys Pro Pro Ala Glu Val Val Pro
            180                 185                 190

Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg Leu Val His His Asn
        195                 200                 205

Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro Ala Val Leu Arg Trp
    210                 215                 220

Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala Ile Glu Val Thr His
225                 230                 235                 240

Leu His Gln Thr Arg Thr His Gln Gly Gln His Val Arg Ile Ser Arg
                245                 250                 255

Ser Leu Pro Gln Gly Ser Gly Asn Trp Ala Gln Leu Arg Pro Leu Leu
            260                 265                 270

Val Thr Phe Gly His Asp Gly Arg Gly His Ala Leu Thr Arg Arg Arg
        275                 280                 285

Arg Ala Lys Arg Ser Pro Lys His His Ser Gln Arg Ala Arg Lys Lys
    290                 295                 300

Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val
305                 310                 315                 320

Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr
                325                 330                 335

Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr
            340                 345                 350

Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile
        355                 360                 365

Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu
    370                 375                 380
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Val Val Glu Gly Cys Gly Cys Arg
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<212> PRT
<213> Bos taurus

<400> 7
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<210> 8
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<213> Bos taurus

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<210> 9
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<212> PRT
<213> Bos taurus

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1   5

<210> 10
<211> 9
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1   5

<210> 11
<211> 6
<212> PRT
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<400> 11
Asn Gln Glu Ala Leu Arg
1   5

<210> 12
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<213> Bos taurus

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1 5 10

<210> 13
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<212> PRT
<213> Bos taurus

<400> 13
Phe Asp Ala Tyr Tyr
1 5

<210> 14
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<212> PRT
<213> Bos taurus

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1 5 10

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<210> 16
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<400> 16
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<210> 17
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<212> DNA
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<212> DNA
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<220>
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<400> 18
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<220>
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gagggttgtg ggtgtcgcta gtgagtcgac tacagcaaaa tt 42

<210> 20
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<212> DNA
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<220>
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ctgcaggcga gcctgaattc ctcgagccat catg 34

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<212> DNA
<213> Artificial Sequence

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acgattgc 68

<210> 22
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide sequence

<400> 22
ggatgtgggt gccgctgact ctagagtcga cggaattc 38

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<223> Description of Artificial Sequence: Synthetic polynucleotide sequence

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